

RESEARCH ARTICLE

Temporal Analysis of Trade Patterns and Market Dynamics of the Top Ten Agricultural Commodities in India's Import and Export Portfolio (FY 2019-20 to FY 2023-24)

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ABSTRACT

The export performance of India's top 10 agricultural commodities from 2019-20 to 2023-24 is analyzed to identify the underlying potential of the country's export market. This study also examined value and quantity trends by identifying key growth drivers and obstacles, and it provides policy recommendations. After a steady growth through the year 2022-2023, India's agricultural exports fell by about 5.3% in 2023-2024. This fall is due to trade controls and fluctuations in global demand. The need for improved supply chain infrastructure and diverse trade tactics, while emphasizing the durability of value-added goods such as fresh fruits and Basmati rice, was highlighted. The development in India's overall agricultural and related imports from the fiscal years 2019-20 to 2024-25 (up to November) was also examined by examining the value of agricultural imports into India, which had increased significantly over the past six years, peaking in 2022-2023 and then declining after that. This study employs a quantitative approach to identify policy implications, potential causes, and structural adjustments associated with this import trajectory. The results show sensitivity to changes in global prices, a crucial reliance on a small number of essential commodities, and the necessity of targeted domestic efforts to reduce external vulnerability.

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INTRODUCTION

Agriculture is the backbone of the Indian economy as it is an important source of jobs and rural livelihoods. Agriculture accounts for about 50-60% of India's workforce and contributes about 18-20% to GDP (Annual Report, Ministry of Agriculture and Farmers Welfare, 2024-25). India exports a wide range of commodities, making it a significant player in the global agricultural trade (Madhusudhan, 2015). India is the 8th-largest agricultural exporter globally, with

agricultural exports totalling about \$48.77 billion in FY24, down from \$51.12 billion in FY23 due to export restrictions on rice and wheat. Understanding market dynamics, guiding policy decisions, and boosting trade competitiveness all depend on tracking export trends of important agricultural commodities. India's exports of the top ten agricultural commodities from 2019-20 to 2023-24 are examined, with an emphasis on sectoral growth patterns and value and volume indicators. Export trends of India's top agricultural commodities

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from 2019-20 to 2023-24 show fluctuating growth influenced by global commodity prices, domestic policies, and international events such as the Russia-Ukraine war. Ironically, India continues to import key food and agro-industrial commodities despite being one of the world’s largest producers and consumers of agricultural products (Kumar *et al.*, 2024). The bulk of the population is supported by local production, but vital supply gaps are filled by foreign trade, particularly in industrial raw materials, edible oils, and pulses. India imports edible oils, pulses, spices, and cotton, driven by domestic production shortages and global price volatility; imports have fluctuated significantly in recent years (Bhatia *et al.*, 2021). Agricultural imports have fluctuated significantly during the past six fiscal years due to changes in domestic policy, price volatility, and interruptions in the global supply chain. To understand the underlying economic patterns and prospects for the future, this study examines annual trends in total agricultural and related import values.

MATERIALS AND METHODS

The study uses official data from the Department of Commerce, Government of India, with preliminary statistics for 2024-25 (up to November), to calculate export values (Crores) and volumes (‘000 tonnes) for the years 2019-20 through 2023-24. The total value of India’s exports and imports related to agricultural commodities, in Crores, from FY 2019-20 to FY 2024-25 is represented by data collected from the Annual Report, Ministry of Agriculture and Farmers Welfare, 2024-25. The data was utilized to analyze commodity-specific trends, year-over-year growth calculations, and the qualitative evaluation of trade policies influencing export performance. Along with the time-series trend analysis using year-over-year (YoY) growth rates, projecting the consequences for the full fiscal year 2024-2025. Interpretation of the exports and imports of the top 10 agricultural commodities was illustrated.

RESULTS AND DISCUSSION

Table 1 shows that, between 2019-20 and 2022-23, India’s agricultural exports increased steadily due to rising global demand and diversification into value-added products. However, due to disruptions in global demand, export limitations (especially on wheat and non-Basmati rice) and price pressure, exports decreased by 5.29% in 2023-2024.

Table 2 identified that the value of basmati rice rose by around 18%, indicating consistent growth and the high demand for premium rice varieties worldwide. Due to export restrictions imposed to stabilize domestic supply, non-Basmati rice exports dropped by 14%. Fresh fruit exports expanded by approximately 72% in value, suggesting stronger logistics systems and enhanced global market recognition. Sugar shipments declined sharply (-25%) due to a global glut and government export prohibitions. Marine Products, seafood markets were stable, with slight fluctuations in volume and significant value growth (+37%). While market and regulatory limitations harmed staples like sugar and non-Basmati rice.

Figure 1 presents the export values of major agricultural and allied commodities, which exhibited a general increasing trend during the period from 2019-20 to 2022-23, followed by a gradual decline in subsequent years. Most commodities, including marine products, rice (Basmati and non-Basmati), spices, buffalo meat, sugar, oil meals, miscellaneous processed items, coffee, and fresh fruits, recorded steady growth in export earnings up to 2022-23, which emerged as the peak year for nearly all categories. Among these, fresh fruits, sugar, and miscellaneous processed items accounted for the highest export values, indicating their increasing importance in the export market. Spices, coffee, and oil meals also demonstrated notable growth, although their contribution remained comparatively moderate. In

Table 1. Overall export trends

Year	Export Value (₹ Crores)	YoY Growth (%)
2019-20	252,400.96	-
2020-21	310,130.85	+22.9%
2021-22	374,611.64	+20.8%
2022-23	426,756.56	+13.9%
2023-24	404,172.59	-5.29%



Table 2. Top export commodities overview

Commodity	2019-20 Value (₹ Cr)	2023-24 Value (₹ Cr)	Qty ('000 Tonnes) 2023-24	% Change in Value (2019-20 to 2023-24)
Marine Products	1,329.0	1,819.6	61,043.7	+37%
Rice - Basmati	4,454.8	5,242.2	48,389.2	+18%
Rice (Non-Basmati)	5,056.3	4,360.6	37,804.5	-14%
Spices	1,193.4	1,415.2	35,174.0	+18.6%
Buffalo Meat	1,152.3	1,295.6	31,007.0	+12.4%
Sugar	5,798.5	4,360.6	23,390.2	-25%
Oil Meals	2,655.8	4,272.9	14,191.6	+61%
Misc Processed Items	0	0	13,686.3	NA
Coffee	257.0	297.9	10,644.8	+16%
Fresh Fruits	834.8	1,438.5	9,496.2	+72%

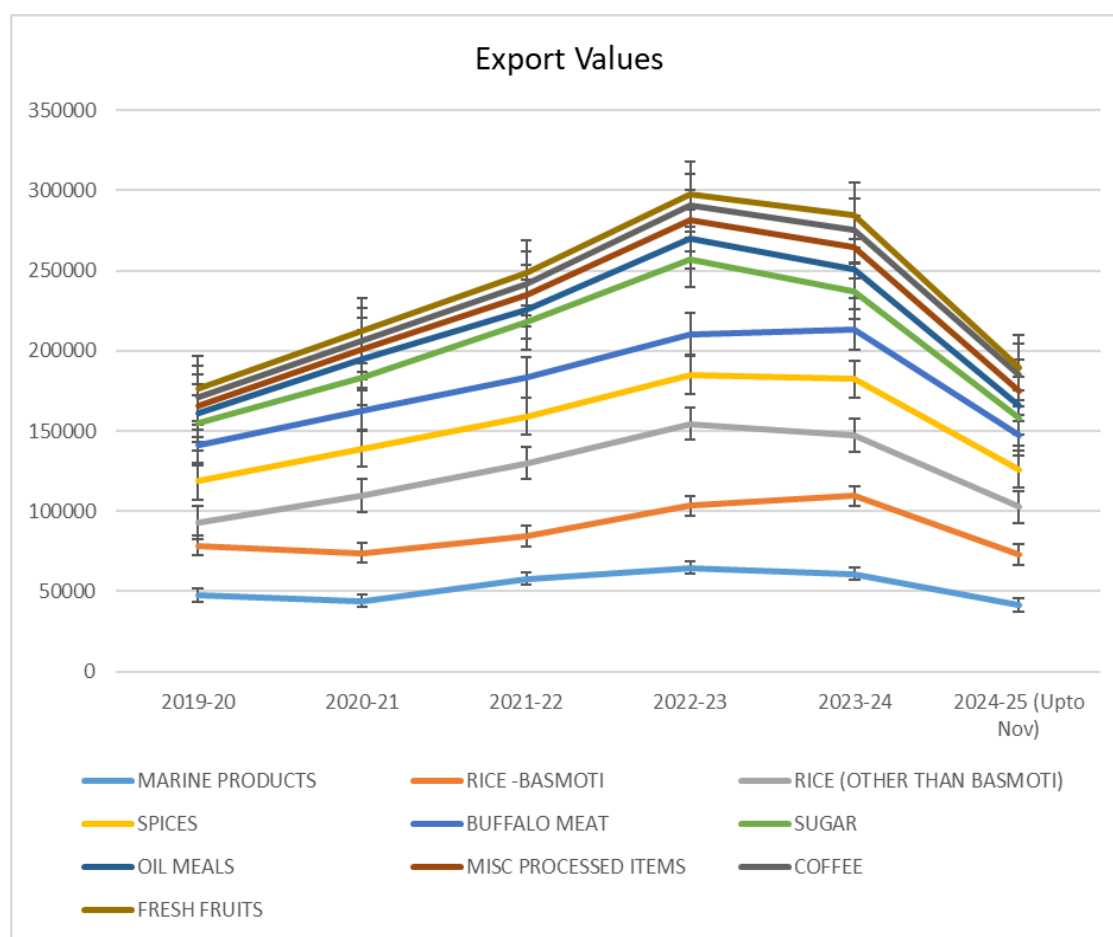


Figure 1. India's Exports of Top-10 Agricultural Commodities (2019-20 to 2023-24)

contrast, marine products, rice, and buffalo meat showed relatively lower export values throughout the study period. During 2023-24, a marginal reduction in export values was observed across most commodities, while a more pronounced decline became evident in

2024-25 (up to November). This recent downturn may be attributed to fluctuations in international demand, changes in trade policies, supply chain disruptions, or global economic uncertainties. Overall, the analysis

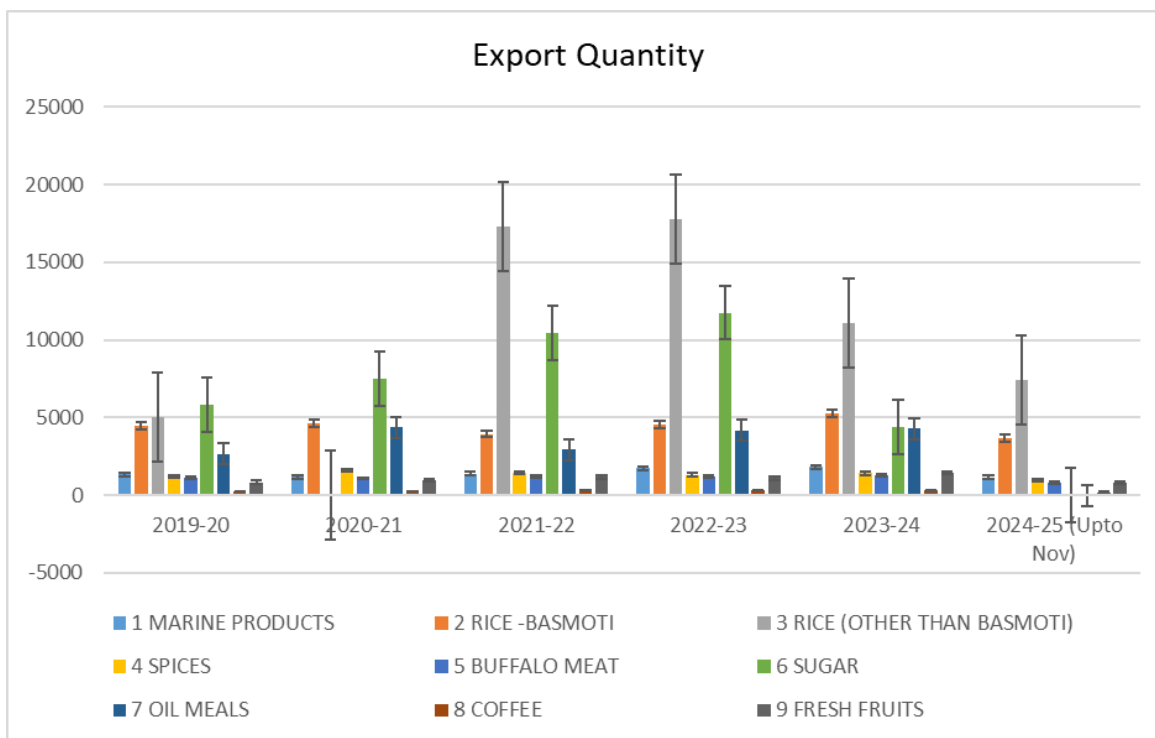


Figure 2: The trend in export quantities of major agricultural and allied commodities from 2019-20 to 2025-26 (up to November)

suggests that although agricultural exports expanded substantially in the early years, their performance has weakened in recent years, highlighting the need for appropriate policy measures to sustain growth in the export market.

Figure 2 presents the trend in export quantities of major agricultural and allied commodities from 2019-20 to 2025-26 (up to November), revealing notable fluctuations across product categories. Among all commodities, rice (other than basmati) consistently dominates export volumes, showing a sharp rise from 2019-20, peaking in 2022-23, and then declining moderately in subsequent years. Basmati rice exports remain relatively stable, with only minor fluctuations, indicating steady international demand. Buffalo meat and spices exhibit moderate growth, with spices showing a gradual upward trend until 2022-23, after which they stabilize. Sugar exports exhibit variability, peaking around 2022-23 and then declining, possibly reflecting policy or production changes. Marine products and oil meals show moderate but fluctuating trends, while coffee and fresh fruits maintain comparatively lower export quantities throughout the period. Overall, the data highlights the dominance of rice exports in the agricultural trade basket, alongside moderate diversification across other commodities,

with a general peak in export performance observed around 2021-22 to 2022-23, followed by a slight contraction thereafter.

Table 3 shows that the fastest growth was observed in 2021-2022, primarily due to global price hikes (post-COVID supply shocks, crude oil-related inflation). A correction occurred in 2023-2024, either due to improved domestic supplies or a global drop in commodity prices. 2024-25 already accounts for about 80% of FY 2023-24 imports, although it is incomplete, suggesting an additional significant annual amount. There will be a significant increase from 2020-21 to 2022-23, and in 2023 and 2024, a slight decline or plateau in total agricultural and allied imports. Based on extrapolating data from November, there may be renewed growth in 2024-2025.

Figure 3 illustrates the trend in import values of selected agricultural commodities from 2019-20 to 2024-25 (up to November), showing a clear pattern of growth followed by a decline. Import values for all commodities, including vegetable oils, pulses, fresh fruits, sugar, spices, cashew, alcoholic beverages, natural rubber, other oilseeds, and raw cotton (including waste), exhibit a steady increase from



Table 3. Growth leaders and decliners in 2023-24

Commodity	% Change in Export Value (2022-23 to 2023-24)
Fresh Fruits	+31.16%
Rice - Basmati	+25.6%
Processed Vegetables	+31.98% (from misc. processed items)
Cotton (Raw)*	+48.75%
Buffalo Meat	+10.2%
Sugar	-63%
Non-Basmati Rice	-25.9%
Spices	-8.0%
Coffee	-5.8%
Oil Meals	-1.6%

Source: Department of Commerce, Government of India

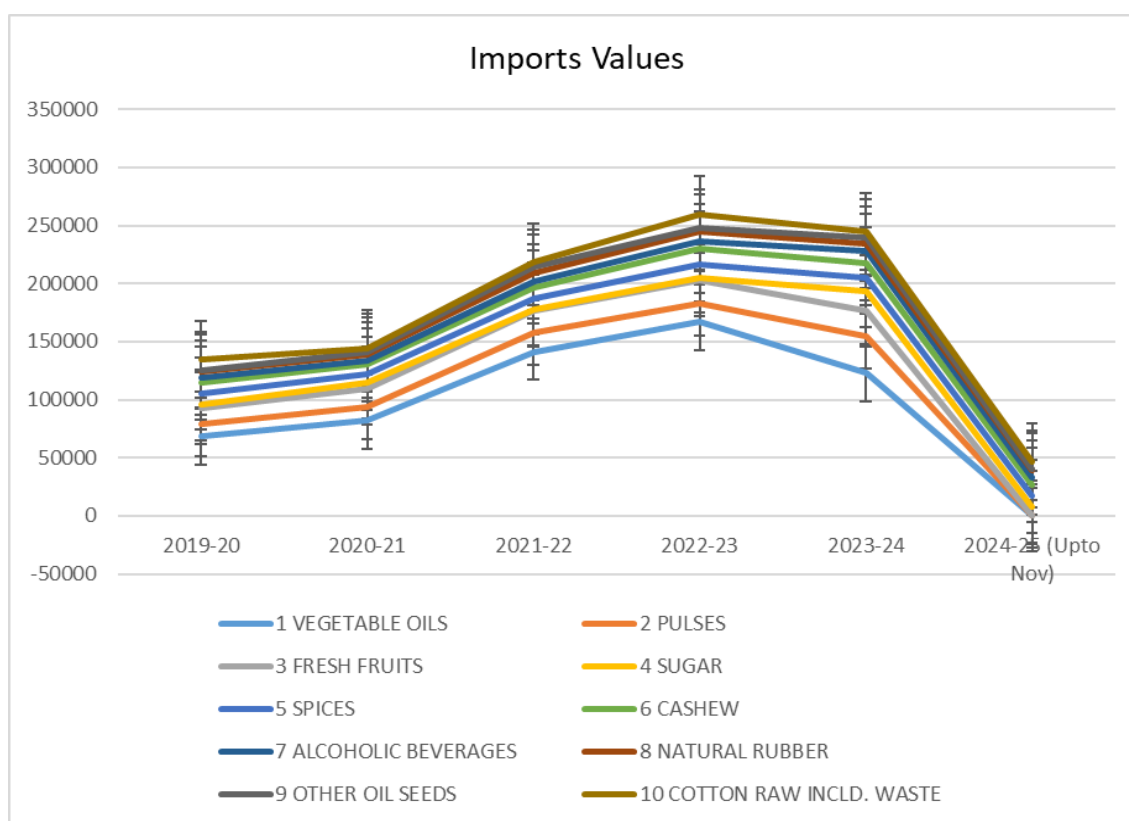


Figure 3: The trend in import values of selected agricultural commodities from 2019-20 to 2024-25 (up to November)

2019-20, peaking in 2022-23. This upward trend reflects rising domestic demand and possible supply constraints in the domestic market. In 2023-24, import values show a slight moderation, followed by a sharp decline in 2024-25 (through November), which may be attributed to policy interventions, improved domestic production, or changing global market conditions. Among commodities, vegetable oils and

pulses account for a significant share of total imports, consistently maintaining higher values than other commodities, while items such as alcoholic beverages and natural rubber contribute relatively smaller shares. Overall, the trend indicates a period of strong import dependence culminating in 2022-23, followed by a noticeable contraction in recent months.

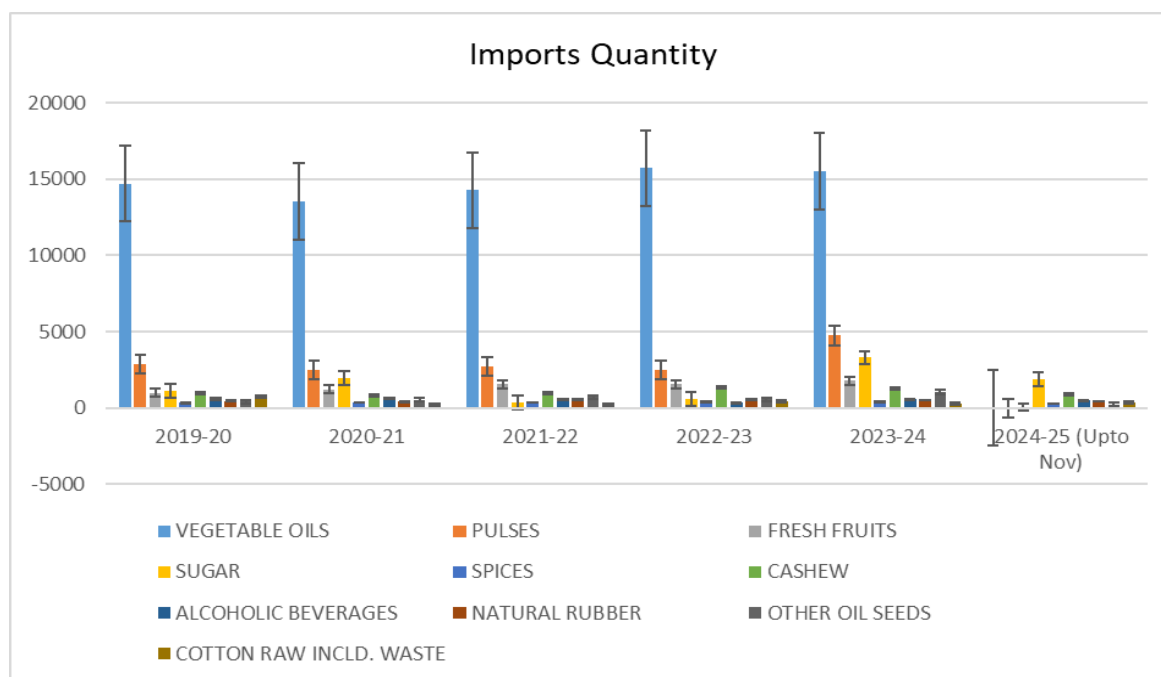


Figure 4: The trend in import quantities of major agricultural commodities from 2019-20 to 2024-25 (up to November)

Source: Department of Commerce, Government of India

Figure 4 depicts the trend in import quantities of major agricultural commodities from 2019-20 to 2024-25 (up to November), highlighting significant variation across commodity groups. Vegetable oils dominate the import basket throughout the period, maintaining consistently high volumes and peaking around 2022-23, followed by a slight decline thereafter. Pulses represent the second-largest category, showing moderate fluctuations with a noticeable surge in 2023-24 before dropping sharply in the latest period. Imports of sugar also show variability, with intermittent increases and a marked rise again in 2024-25 (through November). Other commodities, such as fresh fruits, spices, cashew, and natural rubber, contribute relatively smaller shares and exhibit minor fluctuations without a clear long-term upward trend. Alcoholic beverages and other oilseeds remain low in volume across all years. Overall, the data suggests a strong dependence on vegetable oil imports, moderate variability in pulses and sugar, and relatively stable but low import levels for the remaining commodities, with a general contraction in total import quantities in the most recent period.

The factors affecting import growth structure include commodity prices around the world. It was

evident after the pandemic that the prices of vegetable oil and beans surged. Domestic shortfalls, such as poor monsoons, crop diseases (including yellow mosaic disease in pulses), and reduced domestic production, raised the demand for imports. Policy liberalization during particular periods, trade relaxations, or reduced tariffs may have promoted higher imports. Shift in urban demand results from growing imports of processed foods and exotic fruits.

India's agricultural trade trends from 2019-20 to 2023-24 highlighted both enduring vulnerabilities and structural strengths. According to export performance, commodities with higher value addition, like fresh fruits, buffalo meat, and Basmati rice, saw steady growth, aided by increased demand worldwide, better branding, and a wider range of trading destinations (Ministry of Commerce and Industry, 2019-2024; FAO, 2021-2023). For instance, the export value of fresh fruits increased by 72% between 2019-20 and 2023-24, indicating improvements in the supply chain and increased demand worldwide. Similarly, favorable price dynamics and growing demand in Asian countries drove a 61% increase in the value of oil meals.



The vulnerability of staples to policy-driven restrictions and global market saturation is further highlighted by the decrease in exports of non-Basmati rice (-14%) and sugar (-25%) (Government of India, 2022-2024). To protect the domestic supply, the government occasionally imposed limitations on sugar exports, making them relatively unstable. Due to declining global prices and heightened competition from other nations, coffee and spices also exhibit declines in 2023-2024 (WTO, 2023). The divergent developments resulted in the dual nature of India's export strategy, establishing staples with newly developing high-value commodities.

Conversely, imports show a systemic reliance on a small number of essential commodities. Due to India's low domestic oilseed yields, vegetable oils have consistently accounted for a significant share of agricultural imports and dominated the import basket (NSO, 2023). Imports of pulses have increased, especially during unfavourable monsoon years, highlighting India's susceptibility to yield disparities and climatic variability (NITI Aayog, 2022). The impact of increasing urban consumption and nutritional variety is evident in the import of fruits, cashews, and alcoholic beverages. It's interesting to note that early data for 2024-2025 indicate a decline in imports of vegetable oils, suggesting that policies such as the National Mission on Edible Oils are having an impact (Government of India, 2022-2024).

These findings imply that India needs to adopt appropriate approaches, i.e., improving global competitiveness by prioritizing exporters in product variety, branding, and certification, especially for commodities with added value. Reduction in reliance on outside sources, which is essential to increase domestic production of oilseeds and pulses through research, irrigation expansion, and price assistance (NITI Aayog, 2022). And to reduce post-harvest losses and increase the export potential of perishable items such as fruits and vegetables, investments in cold-chain and processing facilities are required.

Considering these approaches, the reviewed period shows India's capacity to increase exports of high-end and processed agricultural products while revealing a persistent dependence on imports for basic foods and agro-industrial goods. To maintain India's place in the international agricultural trade system, a well-balanced combination of supply chain modernization, domestic capacity growth, and calibrated export management is required to ensure long-term resilience.

Trade Dynamics and Challenges

Government restrictions on the export of staple grains have constrained trade performance and strained existing supply chains. Due to pressure from competition and falling global pricing, exports of coffee and spices have suffered. Global overstock and export limitations led to volatility in the sugar market.

The challenges faced, and the respective recommendations are indicated as follows:

Challenge	Recommendation
<i>Trade volatility and export restrictions:</i>	Instead of implementing complete prohibitions, implement smart stock management.
<i>Instability in commodity prices:</i>	Strengthen Minimum Support Prices (MSP) in accordance with export regulations.
<i>Inefficiencies in the supply chain:</i>	Investment in processing facilities and cold chain logistics
<i>Limited variety of exports:</i>	Utilize branding and quality certification to market specialized and valuable agricultural products.
<i>Increase domestic production of pulses:</i>	Through extension services, MSP, and irrigation.
<i>Maintain market stability for oilseeds:</i>	Supporting pricing, research, and development for high-yield cultivars
<i>Increase trade resilience:</i>	By using long-term contracts and diversified sources.
<i>Make supply chain investments:</i>	To lessen losses and dependency, imports of fruits and perishable goods



CONCLUSION

Between 2019-20 and 2023-24, India's agricultural trade trends show both resilience and fragility. Until 2022-2023, the nation's exports showed a steady increase, mostly due to value-added goods, including fresh fruits, marine products, and Basmati rice. But the 2023-2024 shrinkage highlighted how easily supply chain inefficiencies, trade restrictions and outside market shocks can undermine advances. Commodities most affected by export restrictions and demand fluctuations include sugar and non-Basmati rice. On the other hand, the strong performance of processed foods and fresh fruits suggests that diversification and product improvement are becoming increasingly crucial for raising India's agricultural competitiveness internationally. On the other hand, imports show a structural reliance on specific commodities, including vegetable oils and pulses, which reflects changes in domestic supply and dietary preferences. The overall increase in agricultural imports, even in the face of governmental initiatives such as the National Mission on Edible Oils, underscores how susceptible India's agri-food system is to changes in global prices, climatic vagaries, and demand-side pressures associated with urbanization. The preliminary data for 2024-25 shows that import demand would continue to be high, despite the minor decline in 2023-24, suggesting that domestic initiatives may be starting to take impact. For maintaining equilibrium in the market and ensuring continued competitiveness, India's agricultural trade strategy should be based on three main pillars: (i) properly calibrated export management, (ii) increasing domestic productivity through investments in R&D, irrigation, and resilient crop varieties (iii) modernising the supply chain, particularly the cold chain and processing infrastructure, to lower post-harvest losses and increase value realisation. In addition to maintaining trade stability, ensuring balanced growth between imports and exports is crucial for protecting national food security and farmers' welfare. Therefore, a practical policy that boosts local capacity while taking advantage of international opportunities is essential to the future of India's agricultural trade.

Author Contributions:

Suparna Sarkar did conceptualisation and designing of the research work; Data collection was done by Suparna Sarkar; Analysis of data and interpretation (Suparna Sarkar and Devayan Chatterjee); Drafting of manuscript (Suparna Sarkar, Devayan Chatterjee,

Prattoy Sarkar and Deblina Ghosh), Critical revision of the article (Suparna Sarkar, Devayan Chatterjee, Prattoy Sarkar and Deblina Ghosh), Drafting of literature cited (Prattoy Sarkar and Deblina Ghosh), Editing and Finalisation of the manuscript preparation (Suparna Sarkar and Devayan Chatterjee)

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Ethics Statement:

The study did not involve any human or animal participants; therefore, ethical approval was not required.

Originality and Plagiarism:

The authors confirm that this manuscript is an original work and has not been published elsewhere. All sources of information has been appropriately cited and the plagiarism is within the acceptable limits.

Consent for Publication:

All authors have read and approved the final version of the manuscript and consent to its publication

Competing Interests:

The authors declare that they have no competing financial or non-financial interests that could have influenced the work reported in this paper.

Data Availability:

All data supporting the findings of the study has either been included within the manuscript or cited appropriately from authenticated sources.

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